

having given him "more comfort than anything for a long while. I wish to Heaven," he says, "it had reached me six months ago. It would have saved me a world of pain and error."

Huxley had two great objects in life as he has himself told us. "There are," he said, "two things I really care about—one is the progress of scientific thought, and the other is the bettering of the condition of the masses of the people by bettering them in the way of lifting themselves out of the misery which has hitherto been the lot of the majority of them. Posthumous fame is not particularly attractive to me, but, if I am to be remembered at all, I would rather it should be as 'a man who did his best to help the people' than by any other title."

It is not only because we, many of us, loved him as a friend, not only because we all of us recognise him as a great naturalist, but also because he was a great example to us all, a man who did his best to benefit the people, that we are here to do honour to his memory to-day.

THE ORIGIN AND PROGRESS OF SCIENTIFIC SOCIETIES.¹

ON the present occasion I propose to say a few words on a subject of little practical importance, so far as the needs of every-day life are concerned, but still not without some general interest, and not without a direct bearing on the history of the advancement of human knowledge—the "Origin, Development and Aims of our Scientific Societies." The subject is a large one, and it will be impossible to enter into details with regard to its almost innumerable ramifications. In justification of a considerable degree of limitation, I may incidentally mention that the "Official Year-book of the Scientific and Learned Societies of Great Britain and Ireland," for the year 1900, extends over upwards of 290 octavo pages.

In England no learned society received a Royal Charter before 1662, when the Royal Society was incorporated by Charles II. It had, however, been instituted in 1660. So early, moreover, as 1645 the lovers of experimental philosophy formed a society which met weekly in London on a certain day to treat and discourse of philosophical affairs, and many of its members became subsequently the first Fellows of the Royal Society. About the year 1648–1649, this little band of students was divided into two—one part remaining in London and the other migrating to Oxford, where a Philosophical Society of Oxford was established that subsequently for some time worked in concert with the Royal Society, and did not finally cease to exist until 1690.

About the year 1572, "divers gentlemen of London, studious in antiquities, formed themselves into a College or Society of Antiquaries." The honour of this foundation is "entirely due to that munificent patron of letters and learned men, Archbishop Parker. The members met near 20 years at the house of Sir Robert Cotton, and, in 1589, resolved to apply to the Queen for a charter of incorporation, and for some public building, where they might assemble and have a library." A petition was prepared for presentation to Her Majesty Queen Elizabeth praying for the incorporation of "An Academy for the Studie of Antiquity and History," the meetings of which were to be held in the Savoy, or the dissolved Priory of St. John of Jerusalem, or elsewhere. It is uncertain whether this petition was ever presented, but the Queen seems to have given the society her countenance, and under the presidency of Archbishops Parker and Whitgift successively it flourished, and a list of thirty-eight of its members, comprising such well-known names as Camden, Cotton, Erdeswicke, Lambard, and Stow, is still extant. For some cause or other Elizabeth's successor, James I., thought fit to dissolve the society in 1604, and though attempts were made to revive it in 1617, and though there was an Antiquaries' feast on July 2, 1659, the society remained in a dormant condition until 1707. It then held weekly meetings at the "Bear Tavern" in the Strand, and afterwards at the "Young Devil Tavern" in Fleet Street, subsequently moving to the "Fountain Tavern." In 1718 the society was reconstituted, and in 1751 a Charter of Incorporation was granted to it by George III., who declared himself the founder and patron of the Society of Antiquaries of London.

Having traced the inception of the two oldest of our learned

¹ Abridgment of an address delivered at the opening meeting of the Society of Arts, November 21, by Sir John Evans, K.C.B., F.R.S.

societies, which in their early stages partook more of the nature of clubs than of what are now known as societies, I propose, before considering their further developments, to say something as to the proper aims and objects of a learned society, and the means usually adopted for carrying them into effect. Such a society is an association of persons united together by common tastes and anxious to improve or extend some particular branch of knowledge, or even the whole range of scientific inquiry. With this object in view it becomes necessary to hold periodical meetings for the discussion of subjects in which the society is interested, and for taking such action in respect of them as may seem desirable. The holding of such meetings involves an organisation and the appointment of presidents to take the chair at meetings, of secretaries to summon them, and of a treasurer to receive those subscriptions without which an association of the kind cannot exist. Moreover, for the determination of questions of policy and finance, especially when the society issued publications, a council of some kind becomes a necessity. It is on this organisation that the success or failure of a society mainly depends, and the questions as to the length of period that presidents and others should remain in office, what proportion of new blood should be infused into the council each year, and how far those in power are carrying out the views of the bulk of the members of the society, have frequently been discussed with more or less warmth. In some instances the too conservative apathy of the council has led to disruption and the foundation of new societies, or to the society under their charge being reduced to a state of inanimate slumber, while on the other hand too rapid revolutionary measures have led to diminutions in numbers, if not to absolute rebellion. Much, of course, of the welfare of a society depends upon the character of its publications being kept at a high level, and on their being brought out with scrupulous regularity.

There is one condition in the life of a scientific society which is entirely beyond its control or that of its council, and this condition may be superinduced by the activity of the society itself. As researches proceed and knowledge extends, new branches of inquiry are opened, which can only be investigated by those who apply themselves specially to the subject. New publications are required, particular days have to be set apart for the discussion of the new subject, and eventually it is found desirable to establish a separate branch of the old society, or to constitute a new one. The latter course is the one that has been most often adopted, especially in the case of biological science; and not infrequently the new society finds a home in the apartments of the parent society, and under its fostering care.

Let us now go back to the period when Charles II. granted his second Charter to the Royal Society of London for improving natural knowledge. The Society of Antiquaries was in abeyance, so that the Royal Society was practically the only institution of the kind in Britain, and its aims were naturally wide. On November 20, 1663, the society consisted of 131 Fellows, of whom 18 were noblemen, 22 baronets and knights, 47 esquires, 32 doctors, 2 bachelors of divinity, 2 masters of arts, and 8 strangers or foreign members. With the exception of the large proportion of physicians or doctors, it will be observed that the society in the main was composed of noblemen and gentlemen of independent position, and that the professional element was to a very great extent wanting. Great attention was paid to experimental methods; but "what the learned and inquisitive are doing, or have done in physick, mechanicks, opticks, astronomy, medicine, chymistry, anatomy, both abroad and at home" were subjects on which they were solicitous. Many of the branches of science diligently pursued at the present day were either unknown or in their infancy. The variation of the compass had been observed, but magnetism and electricity presented almost untrodden fields; the steam engine was in an embryonic stage; visions of space with four or more dimensions had not visited the poetical mathematical brain; microscopes and telescopes were in their infancy; the family of the planets was no more numerous than of old; the circulation of the blood had not met with universal acceptance, and the existence of *bacilli* was but dimly conceived; chemistry was of the crudest, and the elements were earth, air, fire and water; anatomy had already made notable advances, but Dermatological, Laryngological, and Odontological societies were not even dreamt of; geology was unborn, and paleontology did not exist, except in connection with Noah's Deluge.

One of the results of this very wide scope of the Royal Society was, that at its meeting the variety of subjects brought forward

for discussion was great; and the early volumes of the *Philosophical Transactions* contain a large amount of miscellaneous reading. I am not sure that, as a means of whiling away a spare half-hour, one of the first twenty volumes of the *Transactions* would not be found more attractive and amusing than the volume, say, of Series A for the year 1900.

The Society for the Encouragement of Arts, Manufactures, and Commerce was founded in 1754, but not incorporated until 1847, and this society, together with the two already mentioned, form the trio from which nearly all the numerous learned societies of the present day have sprung, by what may be regarded as a natural process of evolution.

As might have been expected, Scotland was not long in following the example set by England, and the Medical Society of Edinburgh was instituted in 1734, to be followed by the somewhat kindred Harveian Society in 1752. In the meantime, the Royal Society of Edinburgh, or, as it was originally called, the Philosophical Society, was established in 1739. The "Royal Physical Society of Edinburgh," exclusively devoted to "Natural History and the Physical Sciences," was founded in 1771, and by 1813 had absorbed no less than six other societies, which became incorporated in it.

In Ireland, the Royal Irish Academy for "the study of Science, Polite Literature, and Antiquities," was founded in 1785, and may be regarded as combining the attributes of the three parent societies in London.

Among the off-shoots of the Royal Society of London, the first perhaps is the Medical Society, founded in 1773. The Linnean Society, for the cultivation of natural history in all its branches, was founded in 1788, and has from 700 to 800 Fellows. These are the only two London societies coming under this category that date from the last century.

During the century now drawing to its close the vast advances in science, and the innumerable aspects it assumes, has led to the foundation of numerous scientific societies, each with a more or less limited scope. In natural history we have the Horticultural (1804), the Zoological (1826), the Entomological (1833), the Ornithological (1837), the Royal Botanic (1839), the Ray Society (1844), the Palæontographical (1847), and others that it would be tedious to mention.

Geology as a new science had a society founded for its study in 1807, the Geologists' Association followed in 1858, and at a later date the Mineralogical Society (1876). The Royal Astronomical Society (1820) has been supplemented by the British Astronomical Association. Mathematics and Physics have also their own societies, as have also Statistics, a subject which has a mathematical side as well as one in the direction of commerce and the affairs of ordinary life. Engineering is represented, not only by the Institution of Civil Engineers (1818), but by the Institution of Mechanical Engineers (1847), of Mining Engineers (1851), the Iron and Steel Institute (1869), and that of Electrical Engineers (1871). Geography has had its own Royal Society since 1830, Microscopy its society since 1839, and Meteorology since 1850. For medicine, pharmacology, pathology, neurology, anatomy, and some other branches of medical inquiry, special societies have been founded in London. The Victoria Institute or Philosophical Society of Great Britain was founded in 1865, its primary object being the attempt to reconcile apparent discrepancies between Christianity and science.

In Edinburgh and Dublin scientific societies have multiplied, though not to a similar extent; and throughout the United Kingdom there are numerous literary and philosophical societies, that of Manchester dating back to 1781. There are also several provincial geological societies, and almost every county has its natural history society or club.

Moreover, the British Association for the Advancement of Science, founded in 1831, continues to hold its annual meetings at different centres in the Empire, and helps to maintain the general interest in the advancement of knowledge and to kindle or keep alive local zeal.

The offshoots from the Society of Antiquaries have not been so numerous or important as those from the Royal Society, the field of Archaeology being much more restricted than the wide domain of more purely "natural knowledge." The Society of Antiquaries of Scotland dates, however, from 1780, and that of Newcastle-on-Tyne from 1813, while the Literary and Antiquarian Society of Perth goes back to 1784. Several branches of antiquarian study have now their own societies. The Numismatic Society was founded in 1836, the Royal

Historical Society in 1868, the Society of Biblical Archaeology in 1871, the Palæontographical in 1873, and that for Hellenic studies in 1879. There are also special societies for the exploration of Palestine and Egypt, as well as the important Royal Asiatic Society with its different branches. The peripatetic habits of the Royal Archaeological Institute and of the British Archaeological Association (both 1843) help to maintain the warmth of local interest and to disseminate a certain amount of archaeological information.

Anthropology and Ethnology have made great advance since the foundation of the Ethnological Society in 1843, and of the Anthropological in 1863. The two merged in 1871 to form the Anthropological Institute, which has rendered signal services to science. A minor branch of anthropology—Folk Lore—has had its own society at work since 1878.

The Society of Arts—to make use of its shortened title—can claim nearly as numerous an offspring as its elder sisters the Royal Society and the Society of Antiquaries. Her descendants, moreover, are fairly entitled to as high, if not indeed a higher, rank and importance. It is not merely the Royal Scottish Society of Arts (1821) that she can claim as an offshoot, but it was the Society of Arts that first in England devoted attention to the all-important objects of forestry and agriculture. The Royal Agricultural Society originated not earlier than 1838, though in Scotland a Society of Improvers of Agriculture was instituted in 1723, a Dublin Agricultural Society in 1731, the Bath and West of England Society in 1777, and the Highland Society in 1784.

It would, moreover, be unfair not to credit the Society of Arts as well as the Royal Society with having laid the foundations on which the Institution of Civil Engineers and the cognate bodies have been erected. The Chemical Society was established at a meeting held at the rooms of the Society of Arts in 1841. From this arose the Institute of Chemistry in 1877. The Society of Chemical Industry (1881) to a large extent grew out of the Chemical Section of the Society of Arts, which dealt for some years with the chemical industries, and was dropped on the foundation of the society. The Sanitary Institute and the other sanitary societies certainly owe their origin to the Conferences on the Health and Sewage of Towns held by the Society of Arts in 1877, 1879, and 1880. The City and Guilds' Institute also originated in consequence of the action of the society in the matter of technical education. They took up and carried on the technological examination founded by the Society of Arts.

It must never be forgotten that in its earlier days inventions of all useful kinds, and all that was new in machinery and manufactures, came within the scope of the society, which in thirty years spent many thousands of pounds in rewards and premiums for useful inventions.

It took a very active part in all educational movements and a warm interest in the welfare of our Colonies, and to its credit be it said that the examinations of the Society of Arts still rank among the most useful and thorough, while the existence of our Indian Section still evinces our interest in the prosperity of the dependencies of the Empire.

What the society has done for the advancement of art, it is difficult for us of the present day fully to appreciate; but it must be remembered that one of the first, if not, indeed, the first public exhibition of pictures was that held in the society's rooms in 1760, and that from this exhibition sprang the Royal Academy, the first exhibition of which, comprising one hundred and thirty-six works only, was opened in 1769. We may, therefore, here claim the Royal Academy as in a certain sense an offshoot from our body. The Royal Institute of British Architects, founded in 1835, may also in some degree be regarded as connected with the Royal Academy, which admits architects among its members. The Photographic Society also grew out of an exhibition of photographs, the first of the kind held in our rooms. The foundation of the Royal College of Music is likewise due to the exertions of the Society of Arts.

It would indeed be difficult to say how far the work done by any society would have been accomplished by the individuals composing that society, without combination or collective organisation. A society of course is only a collection of individuals, and the work of the society is the work of the individuals composing it.

A society offers opportunities for discussion, brings men of similar ideas together, and substitutes collective and organised action for isolated individual effort. It affords means of publication, organises research, records discoveries, stimulates

invention, and assists students by providing a common meeting-place and centre of action. Every scientific discoverer desires immediate publication of his work, both for his own reputation and to secure the assistance of his colleagues. Every industrial inventor requires publication in order that he may secure the natural profits of his invention. A society systematises and arranges the science or study which is its subject-matter.

The present condition of science is certainly due to the organised efforts of such societies as the Royal Society and its subordinate societies in this and other countries. They secure public recognition for science and those who pursue it; they prevent overlapping; serve to deter different men from working on the same lines; and they bring influence to bear on the public and on the Government. Any individual is less powerful by himself than when he is associated with others seeking the same object. An active society is a corporation with a perpetual succession, and it never dies. The work carried on by an isolated student ceases at his death, but the work done by a number of students associated together goes on and on. As one man drops out, another takes his place.

An excellent example of the reciprocal influence of scientific workers and of a scientific institution upon each other is afforded by the Royal Institution. Without Davy, Faraday, or Tyndall, the Royal Institution would never have become the important body it now is. But without the Royal Institution neither Davy nor Faraday would have had any opportunity for carrying out their scientific work and of obtaining their scientific reputation, and perhaps the same may be said to a certain extent of Dr. Tyndall.

The history that I have been tracing comprises within it a record of the advance in many directions of our acquaintance with the secrets of nature, of our turning that acquaintance to practical account, and of the consequent progress of the nation in material prosperity. It bears witness likewise to that specialisation in science, which, though by no means an un-mixed blessing, seems to be of necessity associated with all advancement in natural knowledge. The days are long since past when any single individual could attempt to cope with the whole encyclopedia of science, but the question not unfrequently arises at the present day whether the position of the specialist would not be more secure were the foundations on which he builds extended over a larger area, and were his scientific sympathies somewhat wider in their character.

Another question that may be asked is whether there is any need for this multiplicity of societies. The answer from any one who in whatever manner believes in evolution will be, that at the time of founding each society a necessity for it must at all events have been thought to exist, and that the analogous societies at that time in being must have been either unable or unwilling to adjust or expand themselves so as to include the subject for the study of which the new society was instituted. Many of the subjects, for instance, that originally came within the domain of the Royal Society, and indeed are still included within it, have by degrees been not absolutely banished from it, but relegated in the main to other societies, founded more especially for the study and illustration of such subjects. The Linnean, the Astronomical, the Chemical, and the Geological Societies afford instances in point, and any attempt to suppress such societies, and to bring their members all within the fold of the Royal Society, would have a disastrous effect on the advance of science, and would absolutely overweight the powers of the Royal Society itself. At the same time it must be remembered that accounts of important discoveries in any of these branches of knowledge are cordially welcomed by the Royal Society, and that it is usually the case that the leading Fellows of these special societies are also Fellows of the Royal Society. The same in a lesser degree holds good with the Society of Antiquaries, as archaeological discoveries, especially when bearing on the early history of man, are welcomed alike on both sides of the quadrangle at Burlington House.

Turning to the more purely philosophical societies that have been established in London, it would seem as if for some reason or other the soil was not congenial for their growth or longevity. The Dialectical Society, founded in 1805, was dissolved in 1888; the Psychological, founded in 1875, ceased to exist in 1879, but was resuscitated under the name of the Society for Psychical Research in 1882. The Zetetical Society, established in 1878, and the Aristotelian in 1880, do not appear in Whitaker's List of Societies and Institutions, though the latter,

notwithstanding that its members are few, is still in active operation. Altogether the number of those interested in abstract philosophy seems to bear no proportion to that of the votaries of the study of nature in all its phases and of those who devote themselves to the application of science to the good of mankind.

In the Institut de France, one of the Académies is that of Sciences Morales et Politiques, which, however, is divided into five sections. Of the eight places devoted to philosophy, only six were filled at the beginning of the present year, but this may have been purely accidental. The mention of the Institut suggests the question how far a similar association of academies would meet the requirements of this country. Such a question is beyond the limits of the present address, but in passing I may say that the necessary limitations of the Institut, the payment for attendance, the method of election of its members, and its close connection with the Government of the day, all present features which are hardly in accordance with our insular traditions. In Paris itself the Institut has had to be supplemented by various important scientific societies, such, for instance, as the Geological Society and the Society of Antiquaries of France.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—Dr. S. H. Hodgson has been appointed an elector to the White's professorship of moral philosophy in succession to the late Prof. Henry Sidgwick.

It will shortly be proposed in Convocation to confer the degree of D.Sc., *honoris causa*, upon Dr. Oliver J. Lodge, principal of the University of Birmingham.

Science scholarships are announced for competition on December 4 at Balliol College, Trinity College and Christ-church; on December 11 at Magdalen College; on January 15 at Jesus College.

CAMBRIDGE.—The complete degree of M.A., *honoris causa*, is to be conferred on Mr. G. H. F. Nuttall, M.D. California, Ph.D. Göttingen, University lecturer in bacteriology and preventive medicine, and on Mr. T. Strangeways Pigg, Advanced Student of St. John's College, University demonstrator of pathology.

The Special Board for Medicine propose a new scheme for the degrees of M.B. and B.C., whereby candidates shall be required to pass a suitable examination in pharmacology (*i.e.* the physiological actions of remedies), and in general pathology and the elements of hygiene, before admission to the final or qualifying examination in medicine, surgery and midwifery.

THE new Ravenscroft metallurgical laboratory of the Birkbeck Institution will be opened on Saturday next, December 1.

DR. BRILLOUIN has been nominated to succeed the late Prof. Bertrand as professor of general and mathematical physics at the Collège de France.

DR. THOMAS BUZZARD, a Fellow and member of the Council of King's College, London, has been appointed one of the representatives of the college upon the Senate of the University of London, in succession to Lord Lister, who has resigned.

AT a meeting of the associates of the Owens College, Manchester, held on November 21, Prof. J. J. Thomson, F.R.S., who is himself an associate, was elected a representative of the associates on the Court of Governors of the college for a period of five years.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, August 21.—“Note on the Occurrence of a Seed-like Fructification in certain Paleozoic Lycopods.” By D. H. Scott, M.A., Ph.D., F.R.S.

The specimens described in the present note show that seed-like bodies, identical with those figured by Williamson under the name of *Cardiocarpon anomalum*, were borne on Lepidodendroid cones, otherwise indistinguishable from *Lepidostrobus*. They thus prove that under the genus *Cardiocarpon*, and even under the “species” *C. anomalum*, totally different objects have been confounded, namely, the seeds of Cordaites or Cycads